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**Language Variation and Literacy Learning: The Case of African American English**

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Although literacy achievement among African American students is much discussed, it is considerably understudied given the magnitude of the problem. The scientific study of reading is one of the major successes in the modern study of intelligent behavior. The main goal of this research has been the development of theories that characterize the nature of reading and the behavioral and neural systems that underlie this skill, with less attention to the many factors that affect individual outcomes. Thus, advances in theorizing make it possible to investigate how a variety of factors affect reading outcomes, but there has been little attention to those specific factors that might be differentially relevant to African Americans or any other group or individual.

This chapter focuses on our current understanding of the relationships between the literacy development of African American children, and their linguistic status as speakers of African American English (AAE). AAE is a major system of linguistic variation in the United States, as well as the most highly studied dialect of English (Wolfram & Thomas, 2002). Its relationship to literacy acquisition continues to challenge researchers and educators alike. Why aren't African American children reading better? What factors contribute to the disparities in reading skills between low- and middle-income African American children and their Caucasian American peers? What is the role of dialectal variation in the acquisition of literacy, and does its role differ depending upon the sociodemographic characteristics of the speaker?

Importantly, the challenges confronting AAE-speaking students during literacy acquisition are not unique to this cultural-linguistic community. Indeed, there are many other languages and cultural groups worldwide experiencing similar challenges to reading acquisition (Saiegh-Haddad, 2003). AAE provides an illustrative example of how linguistic variation, especially low-prestige, nonmainstream varieties, can be related to a child's ability to read. In

this chapter, we begin by presenting the national context for achievement among African American children and then review important new findings that pertain to the language and literacy skills of these students, followed by a discussion of variables that may contribute to the difficulties that they experience. Finally, we identify and discuss a promising new direction and methodologies designed to lead toward greater understanding of the underlying mechanisms linking dialectal variation and literacy acquisition.

### **The National Context**

Reading failure in African American children is a longstanding, high-impact public health concern. African American students are much more likely than their majority peers to fail to obtain basic levels of literacy. The disparity in reading performance between African American children and their White peers has been called the “Black-White test score gap” or the “Black-White achievement gap” (Jencks & Phillips, 1998). Hedges and Nowell (1998) found that significant progress had been made in closing the gap in the three decades preceding 1988, but that a widening of the gap was evident by the early 1990s. Although small improvements have been documented since that time, these gains have not been sustained. Indeed, the 25-30 point gap between African American and Caucasian American children as measured on the National Assessment of Educational Progress (NAEP) has remained virtually unchanged for the last decade. In the 2011 NAEP sample, for example, the majority (84%) of African American fourth-grade students read at or below “basic” levels, while only 16% were considered proficient or advanced readers (NCES, 2011). This is in stark contrast to their White peers at fourth grade, 57% of whom were reading at or below basic levels and 33% of whom were proficient readers. This poor reading performance among African American students also affects performance on other areas of testing, including mathematics and geography (Grigg et al., 2003) (see Table 1).

This gap in achievement test scores and classroom performance has been explained relative to two broad influences: *schooling factors* ([Burchinal et al, 2011](#); Desimone & Long, 2010; Ford, Grantham & Whiting, 2008; [Hanushek & Rivkin, 2009](#)), and *familial and home factors (including poverty)* ([Mandara et al, 2009](#); [Yeung & Conley, 2008](#)). Each is discussed in the sections that follow.

### **Schooling**

The achievement gap is evident upon entry into school. African American children start school about one-half of a standard deviation behind their Caucasian American peers on standardized tests of basic skills, reading and mathematics ([Fryer & Levitt, 2004](#); Hanushek & Rivkin, 2006; Rouse, Brooks-Gunn, & McLanahan, 2005). Condrón (2009) and Fryer and [Levitt \(2004\)](#) describe this gap as a developmental process that begins prior to school entry and then is negatively impacted by the experiences of African American students in the school context. Specifically, for every year that these students are in school the disparity in school achievement reportedly increases by one-tenth of a standard deviation, and this is particularly true of students from low-income families ([Burchinal et al, 2011](#)).

Although achievement disparities reportedly increase the longer African American children are in school, it is not clear whether schools mitigate or exacerbate these differences (Desimone & Long, 2010). That is, would the gap be wider if students were not attending school, or does it widen because of the influence of school? What is clear is that we neither understand the child-based versus school-based factors that are most important to consider nor the best ways to address those factors that we do understand. As Hofferth and Sandberg (2001) noted, these children spend considerably more time out of school than in school, yet there is an undeniable influence of the schooling context. Importantly, the presence of the achievement gap prior to

entry into school supports a growing sentiment that the gap is unlikely to be fully closed by the schools. Rather, other out-of-school influences must be considered and addressed (see also the chapter in this volume by Silliman & Wilkinson).

In a comprehensive examination of factors affecting the achievement gap in preschool-aged children, [Burchinal et al. \(2011\)](#) found that a substantial performance gap was present by 3 years of age, and that the growing achievement gap in low-income children's reading and mathematics trajectories in primary school was influenced significantly by both family and school factors. The latter includes the fact that these students were enrolled in lower-quality child care and preschool environments than their Caucasian American peers of the same low socioeconomic status. The [Burchinal et al. \(2011\)](#) investigation highlighted the importance of early intervention and high quality preschools and further supported substantial evidence that differences in school environments contribute to achievement disparities from a very young age. Fryer and Levitt (2006) reported that these schooling differences from preschool and beyond may account for up to one-third of the reading and mathematics gap.

### **Family and Home**

The family and home environments of African American children have been examined widely for their influence on school performance. These investigations have focused largely on the impact of poverty on the development of literacy and other academic skills. African American children are disproportionately poor, making poverty a very real factor in child outcomes for this population. Table 2 compares key indicators of the economic, social, and educational well-being of African American children to those of their Hispanic and white peers (Federal Interagency Forum on Child and Family Statistics, 2012). Of note, in 2010 African American children were four times as likely as their white peers to live in families with incomes

below 50 percent of the poverty threshold (\$11,057 for a family of four), representing a significant increase from the 2000 census estimates. In addition, African American children continue to be more likely to live in families in which the levels of parental education are lower than for majority children (Federal Interagency Forum on Child and Family Statistics, 2012). Poverty and low levels of literacy tend to co-occur, and without doubt, many African American students are impacted by these family socioeconomic characteristics.

Poverty is theorized to affect child outcomes in a variety of ways. Major poverty-related factors that have been found to place children at particular risk for negative educational outcomes include: (a) deprivation (e.g., poor nutrition, inadequate housing); (b) parental factors, such as maternal depression; and (c) differences in parenting styles documented for lower income parents ([Burchinal et al., 2011](#); Mayer, 1977, [Yeung & Conley, 2008](#)). Indeed, cumulative risk theorists have demonstrated that it is the *density* of any combination of these poverty variables that predicts poor cognitive and social outcomes for children ([Burchinal et al., 2011](#); [Gutman, Sameroff & Cole, 2003](#); [Rutter, 1987](#); [Sameroff et al, 1987](#)). In a sample of first-through twelfth-grade African American students, [Gutman, Sameroff and Cole \(2003\)](#) demonstrated that the presence of four or more risk factors (e.g., maternal depression, low income, absent fathers, low maternal education) contributed to academic trajectories characterized by lower grades and higher absences than is the case for low-risk children, beginning in elementary school and continuing unabated through high school.

Though undeniably and significantly influential, poverty and its covariates are not a sufficient explanation for the reading failure experienced by so many African American students. [Thompson \(2003\)](#) examined the reading skills of fourth-grade, urban, African American students from metropolitan Seattle and found that some students from both low (LSES)- and middle-

socioeconomic-status (MSES) homes were performing at high levels, one standard deviation or more above the mean, on the Woodcock Reading Mastery Tests—Revised ([Woodcock, 1987](#)), a major standardized test of reading. Furthermore, both LSES and MSES African American students were members of the cohort scoring at the lowest levels on this test. These findings are consistent with an earlier report by Singham (1998), who found that reading performances of middle-income African American students were more comparable to those of low-income White students than to middle-income White students. More recently, Gosa and Alexander (2007) confirmed that African American children from middle- and high-income homes were not doing as well as their White peers; affluent African American children performed academically overall at the level of their poor White peers rather than at the level of affluent White students.

These outcomes demonstrate that whereas poverty does not predestine an African American child to reading failure, curiously, higher economic status also does not protect African American children from reading or other academic difficulties, as it appears to do for their White peers. Efforts to explain this unexpected disparity in the performance of African American children from middle-income backgrounds have centered largely on differences in *wealth* rather than income between African American and White families. *Income* refers to the amount of money that a family has at its disposal and is frequently discussed as a primary variable for children growing up in poverty. Alternatively, *wealth* refers to the overall net worth of a family, including home ownership and investments rather than just amount of money in the bank (Gosa & Alexander, 2007; [Yeung & Conley, 2008](#)). Most child outcomes, including academic achievement, college attendance and completion, and even future employment outlook, are significantly impacted by family wealth. Importantly, for African American children, Gosa and Alexander (2007) and others have found that families of African American students from

middle- and upper-income backgrounds reported significantly less net worth than their White, middle and upper income counterparts. These differences in net worth are not explained by income or other demographic characteristics (Conley, 1999; Gosa & Alexander, 2007; Oliver & Shapiro, 1995; [Yeung & Conley, 2008](#)). [Yeung and Conley \(2008\)](#) reported that in many cases when parental wealth is taken into account differences in achievement between middle income African American and White children are eliminated.

Further, past and recent attempts to explain these disparities in family wealth and child outcomes despite similar incomes point to differences in the *length of time* or *depth of membership* in the middle class between White and African American families as an explanatory factor. Specifically, Wilkerson (1990) reported that approximately 70% of White middle and upper income families have middle and upper income ties going back three or four generations. In contrast, upwards of 80% of middle-class African Americans are first generation middle-class ([Yeung & Conley, 2008](#)). According to this explanation it takes time to cultivate the "...values, attitudes, and habits used by parents of successful children to reinforce the school's agenda at home..." (Yeung & Conley, p. 290). Thus, middle-income status does not automatically confer improved performance and changes in habits. Rather, over time a deeper history of economic security and educational attainment should bring these important changes.

These explanations suggest that in the future, when we examine the performance of African American children from middle or upper income backgrounds an important variable to consider will be multi-generational income status rather than income status of the current household only. Accordingly, it will be important for the planning of prevention and intervention programs appropriate for African American students to disambiguate the effects of family income and wealth and their covariates from other more specific barriers to school achievement,



especially literacy acquisition, such as cultural dialect use. Cultural linguistic differences have been identified as important to consider when examining literacy acquisition and skills of African American children, and will be discussed in the sections that follow.

### **Characteristics of Child AAE**

AAE is a systematic, rule-governed variant of English spoken by most African Americans in the United States. The history of AAE has its roots in the Southern United States, having emerged as a variety of English introduced by slaves (see Baugh, 2001, for a comprehensive discussion of the linguistic legacy of slavery). Not surprisingly, given the shared regional history between AAE and Southern White English, several features of AAE and SWE overlap ([Thomas, 2007](#)). Despite this overlap, it has been clear for many years that AAE and SWE are two distinct dialects that differ significantly from Standard American English (SAE) (Green, 2006).

### **Morpho-Syntactic Characteristics of Child AAE**

At school entry, preschool-and kindergarten-aged African American students produce a variety of morpho-syntactic forms of AAE (Craig & Washington, 2002; Washington & Craig, 1994, 2002). They do not, however, use all of the forms that characterize adult AAE. [Washington and Craig \(2002\)](#) compared the morpho-syntactic types of AAE used by preschool, kindergarten, and first-grade students to those used by their primary caregivers (most frequently, the biological mothers). The discourse of the children and their caregivers shared 23 morpho-syntactic forms of AAE, but these young children did not produce another three that were used by the adults. These three AAE forms were *completive done* (“I think we *done* ate enough”), *preterite had* (“You *had* got his toes stuck before”), and *resultative be done* (“We *be done*

dropped these and broke them”). It is important to note that these forms require advanced knowledge of verb constituents, and it was not until the upper elementary grades that the same forms were produced by children in the Midwestern United States. However, Oetting and her colleagues ([Oetting & McDonald, 2002](#); [Oetting & Newkirk, 2011](#)) found evidence for use of these features in the Southern United States, where these forms overlap with the regional southern dialect in Louisiana. These findings underscore the need to examine the linguistic variations of children in their own right rather than assuming that adult and child forms will be the same, an insight that has long been the cornerstone of research in child language acquisition ([Brown, 1973](#)). Regional differences in dialect use may also be evident.

Table 3 lists the morphosyntactic forms that one might expect to encounter in the discourse of school-age African American students, based on research over the last two decades or so that has focused on children’s expressive language. Two features of AAE occur most frequently, and this is the case for both children and their caregivers ([Craig & Washington, 2004](#); [Washington & Craig, 1994, 2002](#)): *zero copula and auxiliary forms of the verb “to be”* (“Where \_\_ the brush?”) and *subject–verb agreement* (“Now she need\_ some shoes”).

Boys may be expected to produce significantly more AAE in their discourse than girls, almost twice the amount ([Connor & Craig, 2006](#); [Craig & Washington, 2002](#); [Washington & Craig, 1998](#)). Low socioeconomic status (LSES) appears related to greater levels of AAE for kindergartners ([Washington & Craig, 1998](#)). In addition, discourse genre influences the frequency of occurrence of AAE forms, such that genres that are more narrative or monologue-like tend to elicit more instances of child AAE ([Horton-Ikard & Miller, 2004](#); [Washington, Craig, & Kushmaul, 1998](#)). Increased levels of AAE can relate to increased levels of linguistic sophistication in young children. [Craig and Washington \(1994, 1995\)](#) found that preschoolers

from low-income homes who were the heaviest dialect users compared to their peers, also used more complex syntactic and semantic forms during spontaneous discourse.

### **Phonological Characteristics of Child AAE**

The empirical study of child AAE to date continues to focus primarily on the morpho-syntactic characteristics of student discourse. Recently, however, there has been increased focus on the phonological characteristics of child AAE as well. Characterizing child AAE in terms of its phonological features is challenging for a number of reasons. In particular, it has been challenging to discern which linguistic variations represent phonological forms of child AAE and which are developmental sound production patterns, as well as which forms that develop differently from SAE represent a developmental trajectory that might be typical for AAE speakers. Pearson, Velleman, Bryant and Charko (2009) examined the phonological productions of African American children ages 4 through 12 years. Their goal was to identify phonological milestones for AAE-speaking children who were learning SAE as a second dialect. The age at which children achieved 90% criterion on production of various consonants and consonant clusters was examined in the initial and final position of words. Results indicated different developmental trajectories for AAE and SAE in this population, and this was particularly true for consonants in word-final position.

In an earlier investigation, Seymour and Seymour (1981) compared the consonant errors of AAE- and SAE-speaking 4- and 5-year-olds, and were unable to identify unique patterns by dialectal group. Both groups evidenced consonant production errors that were more likely developmental in nature, for example, simplification of consonant clusters (*and* /ænd/ changes to *an* /æn/). Only quantitative differences between groups were observed. Consistent with the Seymour and Seymour results, Haynes and Moran (1989) found increased frequencies of final

consonant deletions for AAE compared to SAE speakers. They examined responses to formal testing at each of grades preschool through third grade and convincingly demonstrated the importance of considering the context of maturational development when searching for AAE features. In particular, the mean number of final consonant deletions decreased from 8.02 at preschool to 3.36 at third grade.

Thomas-Tate, Washington & Edwards (2004) confirmed the importance of considering these differences in phonological development for African American children when assessing literacy skills. In a sample of low-income, African American first graders, performance on the early-elementary version of the Test of Phonological Awareness (TOPA; Torgesen & Bryant, 1994) was significantly below the mean and significantly negatively skewed. This version of the TOPA assesses awareness of final consonants. In contrast, performance on the kindergarten version of the TOPA was within normal limits for these children. Importantly, the kindergarten version assesses a student's ability to identify initial sounds in words. Final consonant deletion is a prevalent feature of AAE. Velleman et al. (2009) and Seymour (1986) have suggested that dialect forms that are prevalent and variably included may develop differently than those that do not contrast with SAE, making dialect-influenced forms poor choices for assessing phonological knowledge or awareness.

A number of large-scale, phonologically based, prevention programs have shown significant improvements in later outcomes for children at risk for reading failure ([Brown & Felton, 1990](#); [Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998](#); [Torgesen et al., 1999](#); [Vellutino et al., 1996](#); [Whitehurst et al., 1994](#)). Appreciable numbers of African American students have participated in most of these investigations. African American students represented 50% of the participants in the [Brown and Felton \(1990\)](#), 52% of the participants in the Torgesen et al.

(1999), and 45% of the participants in the [Whitehurst et al. \(1994\)](#) prevention studies. At the time of these studies, the programs were built on understandings of the phonological awareness of mainstream children.

Unfortunately, most reports of these programs did not separate performance outcomes for the African American students, so it was not clear how successful they have been for the African American cohort of the participant samples. On a national level, African American students are overrepresented in the lowest levels of literacy achievement (and, accordingly, may be the children who cluster in the low tail of the performance distributions in these prevention programs as well). Consistent with this view, [Foorman et al. \(1998\)](#) did disaggregate the performances of the African American students participating in their program, and reported significantly lower expected scores for them than for the sample average in word reading after a year's enrollment. Perhaps instructional strategies for African American students need to be distinguished from those designed for SAE-speaking students.

Overall, this focus on the development of the morphosyntax and phonology of AAE has been informative for moving us beyond earlier dependence on knowledge of adult AAE features for understanding the linguistic behavior of African American children. The study of selected features continues (e.g., [Green & Roeper, 2007](#)). These data provide important foundational knowledge for child language and literacy researchers regarding the ways in which specific features operate. Current and future work will focus more specifically on the relationship between these features and reading, providing critical insight into the ways that African American children acquire language and literacy skills as AAE speakers.

Child use of AAE is impacted significantly by a number of important variables, including use of AAE in the family or community, gender, and socioeconomic status. In addition, the

developmental trajectories reported for AAE phonology in particular have suggested that the variation evident in the use of phonological forms influences the timing of mastery of these forms for African American children. Thus, understanding the features of Child AAE provides important foundational knowledge. In order to address language and literacy developmental concerns fully; however, it will be important to move beyond a focus on discrete feature use and development toward a larger focus on the impact of linguistic variation on our efforts to assess language and reading skills and to intervene when problems arise. In addition, more focus on the underlying mechanisms that influence the interaction between dialect and reading in AAE speakers is an area of tremendous need if we are ever to move away from intervention toward prevention of reading difficulties in this population.

### **The Impact of Child AAE on Literacy Acquisition**

#### **Reading**

The role of AAE in the development of reading skills of African American students was the focus of considerable early inquiry. With rare exceptions (Bartel & Axelrod, 1973), the general consensus of these studies was that African American students produced AAE during oral reading tasks, but dialect was unrelated to reading comprehension. This finding was robust across studies for students as early as first grade and extending through ninth grade (e.g., [Rystrom, 1973–1974](#); Steffensen, Reynolds, McClure, & Guthrie, 1982). Dialect appeared unrelated for studies focusing only on morpho-syntactic features ([Gemake, 1981](#); Simons & Johnson, 1973; Steffensen et al., 1982), only on phonological features ([Hart, Guthrie, & Winfield, 1980](#); [Melmed, 1973](#); [Rystrom, 1973–1974](#); [Seymour & Ralabate, 1985](#)), or both ([Goodman & Buck, 1973](#); [Harber, 1977](#)). It is important to note, however, that this prior research was handicapped by its dependence on adult AAE as a theoretical framework and source of

information on specific features for examination.

Empirical investigations of the relationship between children's spoken AAE use and their literacy achievement are becoming more prevalent in the literature and are moving us beyond earlier features-oriented approaches that focused on mismatches between speech and print (e.g., [Charity, Scarborough, & Griffin, 2004](#); [Craig, Zhang, Hensel, & Quinn, 2009](#); Hernandez, Folsom, Al Otaiba, Greulich, Thomas-Tate, & Connor, 2012; Labov & Baker, 2010; Terry, 2006; [Terry & Connor, 2010](#); [Terry, Connor, Thomas-Tate, & Love, 2010](#); Terry & Scarborough, 2011). In general, these studies have included relatively large samples of typically developing children in preschool through the primary grades and increasingly more sensitive measures of AAE feature production (e.g., dialect density and elicited imitation tasks). In contrast to the earlier research reviewed above, researchers have observed statistically significant associations across these studies between AAE production and reading performance. However, the nature of this association has differed across studies and remains unclear.

On the one hand, researchers have found significant, moderate, and negative correlations between frequency or amount of AAE production and language and reading measures. On the other hand are investigations that find positive relationships between dialect and language or literacy outcomes. Numerous studies have reported poorer literacy performance among children who produce AAE features frequently in speech ([Charity et al., 2004](#); [Connor & Craig, 2006](#); Terry, 2006; Terry et al., 2010). In addition, the results from three recent longitudinal studies revealed that children who begin kindergarten or first grade speaking more AAE had poorer word reading and reading comprehension performance at the end of first and second grades than children who used less AAE (Conlin, 2009; Hernandez et al., 2012; Terry & Connor, 2012; Terry et al., 2012).

Alternatively, researchers have also found relatively strong language and literacy skills among AAE speakers. For instance, researchers have found that poor African American preschoolers who speak AAE produce sophisticated complex syntax forms in speech (Craig & Washington, 1994), and that this complex syntax production is positively associated with reading achievement in first through third grades ([Craig, Connor, & Washington, 2003](#)). That is, low income children who spoke AAE frequently performed better than children who spoke AAE at moderate rates.

This latter finding is consistent with studies of English Language Learners (ELLs), which have demonstrated that children who exhibit great proficiency with their native language at the time of school entry have stronger language skills overall than children who do not demonstrate this underlying linguistic strength ([Bialystok, 2007](#)). Indeed, among ELLs there has been a growing and consistent focus on the advantages of bilingualism. For speakers of AAE, we have not typically considered both advantages and disadvantages of dialect use, focusing instead on the deficits believed to be associated with dialectal variation. In many ways we have been limited in our interpretations by our methods, using a subtractive framework that is focused entirely on differences from a linguistic “standard” and interpreting these differences as problematic.

Determination of advantage or disadvantage may prove to be task-specific for African American children, as has been reported for bilingual children ([Bialystok, 2011](#)). For example, Thomas-Tate, Washington and Edwards (2006) demonstrated that for young African American children measures of phonological awareness that focused on final consonants were difficult for African American children who use AAE due to the widely variable inclusion of final consonants in AAE. On the other hand, these children demonstrated typical phonological skills when the initial consonant, minimally affected by AAE, was the focus.



Recent findings also indicate that AAE speakers' speech patterns may not always be reflected in their literacy performance. For instance, researchers have found that young AAE speakers' reading and spelling errors do not always reflect differences between AAE and SAE. In a large, racially diverse sample of 2<sup>nd</sup>-4<sup>th</sup> graders who were poor readers, Labov and Baker (2010) found that many oral reading errors were unrelated to dialect differences, and those related to differences between AAE and SAE did not impact comprehension of the text. Further, in two studies with children in preschool-2<sup>nd</sup> grades, Terry and Scarborough (2011) found that children who spoke AAE frequently displayed considerable knowledge of SAE forms on nonword repetition, picture naming, and naming judgement tasks. That is, children who used more AAE in overt speech had precise lexical knowledge of phonological SAE forms. Importantly, several researchers hypothesize that this precise lexical knowledge is required for successful word reading (Elbro, Borstrom, & Petersen, 1998; Fowler & Swainson, 2004; Metsala & Walley, 1998; Perfetti, 2007; also see chapter by Adlof & Perfetti, this volume).

Finally, researchers have also observed indirect relationships between AAE production and literacy achievement. In samples of children in preschool through second grade, for example, Terry and Scarborough (2011) found that the relationship between AAE production and word reading was mediated by children's phonological awareness. Craig and colleagues (2009) found no direct, significant association between spoken AAE use and reading achievement in a sample of African American first through fifth graders. Rather, children's written production of AAE forms in a writing sample was predictive of reading achievement. Finally, Terry et al. (2010) found that children who spoke more AAE and attended high poverty schools tended to perform more poorly than their peers who also spoke more AAE but attended more affluent schools. A

negative linear relationship also surfaced for phonological awareness that was independent of school poverty levels.

Taken together, evidence from these recent investigations reveals two important trends. *First, converging evidence indicates that AAE production is related significantly to language and literacy achievement among children in preschool through 5<sup>th</sup> grade. Second, not all children who speak substantial amounts of AAE in school are at-risk for experiencing reading failure.* Thus, the obvious question remains: if spoken AAE production itself is not a primary risk factor for poor literacy achievement, then why do so many children who speak AAE perform more poorly on reading achievement measures? Additionally, we should be looking for benefits of AAE use for reading among those children who are AAE speakers, but for whom reading is not negatively affected.

### **Code switching and Metalinguistic Awareness**

Code switching refers to alternation of language or dialect use that occurs across languages or within dialects. Alternation of dialect use within a language is referred to as dialect code switching ([Beebe, 1981](#)); across languages it is called language switching. Code switching is a sociolinguistic and pragmatic phenomenon in which a speaker uses various speech styles or forms based on the characteristics and demands of the linguistic context ([Beebe, 1981](#); [Grosjean, 1998](#); [Wolfram & Schilling-Estes, 2006](#)).

Although it is not clear why some children shift their dialect use and others do not, linguists suggest that in order to code switch successfully a speaker must have strong metalinguistic and pragmatic awareness ([Bialystok, 2007](#); [Bialystok, 2011](#); [Grosjean & Miller, 1994](#); [Wolfram & Schilling-Estes, 2006](#)). Metalinguistic and pragmatic awareness involve

thinking about and manipulating language to accurately and efficiently identify the various language styles available for appropriate use in a given communicative context.

It is notable, that metalinguistic awareness has also been identified as a critical skill for development of grade level reading skills. Given that both reading and code switching rely upon strong metalinguistic awareness, then perhaps it is possible to identify indices of change in dialect use that also capture some aspects of the metalinguistic skills that are necessary for successful acquisition of reading skills. Keeping in mind that children who have stronger metalinguistic skills (e.g., phonological awareness) tend to have less difficulty learning how to read (National Early Literacy Panel, 2009; National Reading Panel, 2000; Scarborough, 2001; Snow, Burns, & Griffin, 1998), it is plausible that reduced sensitivity to and awareness of language could be interfering with some AAE speakers' reading achievement. Terry and colleagues (Terry, 2012; Terry et al., 2010) argue that, rather than conceptualizing use of AAE itself as a risk factor in early reading achievement, perhaps both researchers and educators should focus on the general language skills of young African American children. This would mean looking beyond simple mismatches that are obvious between speech and print. In this view it would be important to ask how linguistically flexible are children who use AAE and do not code switch, and whether the difficulties experienced by these children simply are not evident through traditional language testing or measurement, requiring different methodologies than those we have used to date.

This is not to say that speech-to-print mismatches are unimportant; in fact, the literature reviewed here indicates that mismatches are important, particularly for children who do not change their AAE use in academic contexts spontaneously. However, it is also clear that any child with stronger language skills, irrespective of dialect use, has better literacy outcomes.

Perhaps as children grow older, decreasing AAE use in school (and subsequent increasing SAE use) may be indicative of growing language sophistication that supports the acquisition of reading skills. Accordingly, increasing oral language skills may provide a buffer such that dialect variation does not interfere with reading achievement. Thus, young AAE users may benefit from instruction that considers dialect variation, but that is also focused on improving language sophistication, both linguistically and metalinguistically, prior to and during formal literacy instruction. This kind of instruction would encourage children to become more sensitive and attuned to language, and how it can be manipulated in various contexts and for various purposes, thus developing linguistic flexibility that is important for supporting literacy learning.

Without a doubt, children with stronger language skills will find the task of learning to read easier than children with weak skills. This has been demonstrated for all children regardless of their cultural language backgrounds. Strong general language skills have also been identified as important for development of effective code switching skills cross-linguistically ([Bialystok, 2011](#)), and likely have similar importance for dialect code switching. Thus, in addition to a focus on teaching and learning the language of the classroom, it would benefit many African American children to have intervention or prevention efforts focused on general morphological, syntactic, and semantic skills as well.

### **Examining Underlying Mechanisms**

Theories that focus on risk factors have been informative for understanding the variables that correlate with poor reading outcomes in African American children. In addition, we have learned a great deal about the relationships between cognitive and ecological factors that influence literacy skills in these children. What is missing from this focus is an account of the

mechanisms by which such factors affect learning to read and other aspects of children's school experience, resulting in performance differences.

This is an exciting time for studying reading underachievement in African American children. Advances in computational and statistical modeling provide new opportunities to understand the causal mechanisms underlying the relationship between dialect and other linguistic and literacy skills. Potentially informative new methodologies, including eye tracking, latent class modeling, item response theories, and computational modeling could inform our pursuit of the mechanisms underlying reading performance. Of these, computational modeling represents a particularly innovative and exciting new way to examine the reading skills of African American children and the role of underlying language and dialect skills in the literacy learning process.

### **The Role of Computational Models**

The goal of reading research with African American children using computational modeling methods is to use general theories of the reading process as a framework to investigate whether and how factors relevant to African American experience, such as the use of AAE or higher levels of poverty than in the general population, contribute to low reading achievement. Computational modeling is a tool for developing greater understanding of the neurocognitive mechanisms that give rise to typical and atypical behavior, and establishing closer connections between behavior and its brain bases. Seidenberg and colleagues ([Harm & Seidenberg, 1999](#); [Harm, McCandliss & Seidenberg, 2003](#); [Zevin & Seidenberg, 2006](#)) have developed a series of models addressing many aspects of learning to read, skilled reading, and the bases of reading impairments. The main goal of these models is to develop a detailed, mechanistic understanding

(i.e., underlying mechanisms) of reading and other aspects of cognition based on converging behavioral, neurobiological and computational evidence.

Computational models make an essential contribution by engaging reading at an explicit, mechanistic level. The cognitive and neurobiological processes that underlie reading are mostly unavailable to conscious awareness. People's intuitions about how they read are inconsistent and unreliable; observations are biased by prior beliefs and assumptions. Developing and testing explicit models is an essential step toward overcoming these limitations. The modeling methodology involves implementing, testing, assessing and revising models that instantiate candidate neurocognitive mechanisms. Modeling is a tool for formulating research questions, designing relevant studies, interpreting neural and behavioral data, and identifying basic principles underlying reading and other skills.

Sibley et al. (2012) have begun to use these models to examine the impact of spoken language and dialect differences on learning to read. Spoken language has an enormous impact on the acquisition of basic skills (i.e., learning how spoken and written codes are related), and on comprehension in older readers. It is therefore critical to understand the impact of differences in children's knowledge of spoken language. Children's spoken language characteristics are related to differences in SES and racial/sociocultural background, which may overlay individual differences in cognition, perception, learning, and other capacities; all important considerations for African American children. To address these issues, Sibley et al., (2012) employed a connectionist model (Figure 1) based on [Harm and Seidenberg \(1999\)](#). In this model orthographic patterns input into the model initiated the spread of activation using weighted connections throughout the network ([Harm & Seidenberg, 1999](#); p. 492). The model was constructed using phonological representations that would be encountered by a young child learning to read, phonological word forms were input, and the model "learned" to represent them in

memory. Similarly, in the Sibley et al. investigation, a model was constructed using SAE and AAE corpora which consisted of 1709 monosyllabic words from second grade norms ([Zeno, Duvvuri, & Millard, 1995](#)). SAE pronunciations were taken from an on-line dictionary ([www.dictionary.com](http://www.dictionary.com)). AAE pronunciations were generated using five common AAE rules (Craig et al., 2003), which applied to 866 words (51%).

In the speech phase, phonological codes for words were activated, and the model was trained to maintain these patterns after inputs were removed. After accuracy reached a high level (usually 90%), reading trials were introduced, using four conditions. In the first two conditions, the SAE-Match and AAE-Match conditions, models learned to map spellings onto the same pronunciations as in the speech phase, using spelling and word inputs that matched. In the Mismatch condition, models that were trained with the AAE corpus learned to map AAE spellings onto SAE pronunciations. In the Bidialectal condition, models were trained on both SAE and AAE pronunciations, and then learned to map spellings onto the SAE ones.

Results revealed that spelling-sound mappings were learned more slowly in the Mismatch condition than in the Match conditions (Figure 2) due to words (e.g., BEST ) for which AAE and SAE pronunciations differed. Having learned the AAE pronunciation /bes/, the model had difficulty learning to generate the SAE form /best/ in reading. This penalty was substantial: words that did not differ in SAE and AAE (e.g., MILK) reached 75% accuracy after 350 training trials, whereas words that were pronounced differently than the SAE spelling took 1000 epochs. Performance was slightly poorer in the AAE-Match condition compared to the SAE-Match, due to additional inconsistencies in AAE (e.g., deleting the final phoneme in BEST but not in BET). Though one of these examples includes a consonant cluster and the other does not, the model was searching for consistency in representation; in this case in AAE one word deletes the final /t/ and the other does not, which slowed the model down. The bidialectal

model performed well only when a reliable contextual cue (home vs. school dialect) was provided. Finally, in experiments with African American children and adults, words that were contrastive between AAE and SAE yielded longer latencies and/or more errors than those that did not; the effect size was correlated with amount of AAE use.

These models and experiments indicate that dialect differences create more complex mappings between written and spoken language, which are more difficult to learn -- all other factors aside. Thus there is a basic sense in which the task of learning spelling-sound correspondences, an important element of early reading, is not the same for speakers of the mainstream vs. minority dialects. Taken strictly as a computational learning problem, the task is easier in one case than the other. This difference may contribute to the "achievement gap." If learning to read is literally more difficult for some children than others, but they are assessed against the same achievement standards, a "gap" in performance would be expected to result.

This research raises many questions that need to be addressed in future research. The Sibley et al. investigation examined only one component of learning to read. The impact of dialect differences on acquiring other types of knowledge and processes that underlie skilled reading needs to be assessed in a similar fashion. What is the nature of the reading task for speakers of different dialects? Which components of skilled reading are or are not affected by dialect? What kinds of home and school experiences modulate these effects? These kinds of questions can be addressed using extensions of the computational modeling framework described here. Although much more needs to be learned, these preliminary data make it clear that the assumption that the task of learning to read is the same for all children needs to be critically examined in the educational context in which policies and regulations related to curriculum, instruction, and assessment are formulated.



During this mechanistic phase, we will learn more about the processes impacting reading acquisition for children who speak dialect. However this learning is based on theoretical models constructed in a laboratory. Future research, including controlled experiments and classroom-based observations and assessments, that extend these findings to real children and that test the models' veracity, will be important for development of future interventions and teaching methods that are more informed and targeted than those currently utilized with African American children learning to read.

### **Conclusions**

An enduring question continues to be, why aren't African American students reading better? Despite significant advances in our understanding of reading and reading-related processes, most African American children continue to struggle with reading acquisition. As we discuss in this chapter, a number of potential factors may be involved. Previous research has improved our understanding of the characteristics of child AAE; an approximately 20-year focus on dialect features and their use and distribution has been fruitful. Future research must focus on the relationships between general language ability, dialectal variation, and reading skill acquisition. In addition, a research agenda focused on greater understanding of the impact of the mechanisms underlying successful and unsuccessful reading for African American children from different socioeconomic backgrounds is critical. Future research would benefit from answers to the following questions:

1. What are the relationships between metalinguistic awareness and other cognitive processes and reading acquisition in children who speak AAE?
2. What are the specific mechanisms that contribute to reading success or failure in African American children who use dialect? Which children will be most affected by these variables?

How? Why?

Although the focus of this chapter has been on the acquisition of language and reading by African American students, most of the challenges faced by African American students learning to read and write are echoed in the experiences of students worldwide who are trying to bridge their home and school language varieties and whose culture-specific literacy practices differ from the mainstream. Many of these students are faced with learning to read in their weak language or dialect. For students whose linguistic skills overall are below expectations upon entry into school reading, this is a daunting proposition. As the United States becomes more diverse and the demands for a literate citizenry increase, the need to ensure the literacy acquisition of all students is on the forefront of educational imperatives. Increasing our understanding of the nature and governing principles of these linguistic systems, and the ways that linguistic variation influences literacy acquisition, should greatly improve our ability to impact the educational achievement of all students.

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Table 1. NAEP score results for 4<sup>th</sup> grade African American and White children: score gaps in reading, mathematics, and geography.

Average Scores	African American	White	Gap
Reading	205	231	-26
Mathematics	224	249	-25
Geography	192	224	-32

**TABLE 2. Selected Risk Factors by Population Segment (children aged 0 – 17)**

Population	Black	Hispanic	White
% of U.S. Children	<b>14</b>	<b>23.6</b>	<b>53</b>
% in two-parent households	<b>38</b>	<b>65</b>	<b>77</b>
% living in poverty	<b>39</b>	<b>35</b>	<b>12</b>
% living at 50% below the poverty line	<b>20</b>	<b>15</b>	<b>5</b>
% with parent working full time all year	<b>53</b>	<b>61</b>	<b>79</b>
% low birth weight infants	<b>17.1</b>	<b>11.8</b>	<b>10.8</b>

Source: Federal Interagency Forum on Child and Family Statistics (2012).

**TABLE 3. Morpho-Syntactic Types of Child AAE with Examples from African American Students in the Elementary Grades**

Definition	Example
Ain't: <i>Ain't</i> used as a negative auxiliary in <i>have</i> + <i>not</i> , <i>do</i> + <i>not</i> , <i>are</i> + <i>not</i> , and <i>is</i> + <i>not</i> constructions	"You ain't know that?"
Appositive pronoun: Both a pronoun and a noun, or two pronouns, used to signify the same referent	"And the other people they wasn't."
Completive <i>done</i> : <i>Done</i> used to emphasize a recently completed action	"Done set the fire."
Double marking: Multiple agreement markers for regular nouns and verbs, and hypercorrection of irregulars	"He tries to kills him." "They are taking the poor hitted boy to a hospital"
Double copula/auxiliary/modal: Two modal auxiliary forms used in a single clause	"You must have didn't know that."
Existential <i>it</i> : <i>It</i> used in place of <i>there</i> to indicate the existence of a referent without adding meaning	"I think it's a girl or a boy is yelling."
<i>Fitna/sposeta/bouta</i> : Abbreviated forms coding imminent action	"He fitna be ten." "He bouta fall."
Preterite <i>had</i> : <i>Had</i> appears before simple past verbs	"The car almost had broke his bike."
Indefinite article: <i>A</i> used regardless of the vowel context	"He had a accident."
Invariant <i>be</i> : Infinitival <i>be</i> coding habitual actions or states	"And they be cold."
Multiple negation: Two or more negatives used in a clause	"It not raining no more."
Regularized reflexive pronoun: <i>Hisself</i> , <i>theyself</i> , <i>theirselves</i> replace reflexive pronouns	"Bouta fall and trying to hold hisself back up."
Remote past <i>been</i> : <i>Been</i> coding action in the remote past	"I been knew how to swim."

Definition	Example
Subject–verb agreement: Subjects and verbs differ in marking of number	“He feel cold.”
Undifferentiated pronoun case: Pronoun cases used interchangeably	“Her fell.”
Zero article: Articles variably included	“There wa: fire.”
Zero copula/auxiliary: Copula and verb <i>to be</i> variably included	“He dead.”
Zero <i>-ing</i> Present progressive <i>-ing</i> variably included	The boy is scream help! help!”
Zero modal auxiliary <i>Will, can, do, and have</i> variably included as modal auxiliaries	“He might been in the car.”
Zero past tense : <i>-ed</i> markers variably included on regular past verbs, and present forms of irregulars used	“They were taking him in the ambulance when he crash into the car.”
Zero plural: <i>-s</i> variably included to mark number	“And those saying something with the book in their hands.”
Zero possessive :Possession coded by word order so <i>-s</i> is deleted or the case of possessive pronouns is changed	“He left somebody books on the steps” “They got they two book.”
Zero preposition:Prepositions variably included	“They were playing iceskates.”
Zero <i>to</i> : Infinitival <i>to</i> variably included “	“That man right there getting ready _ slip on his one foot.”

*Note.* Data from Craig et al. (2003); [Washington and Craig \(1994, 2002\)](#).



Figure 1: Model based on Harm & Seidenberg (1999) used by Sibley et al. (2012)

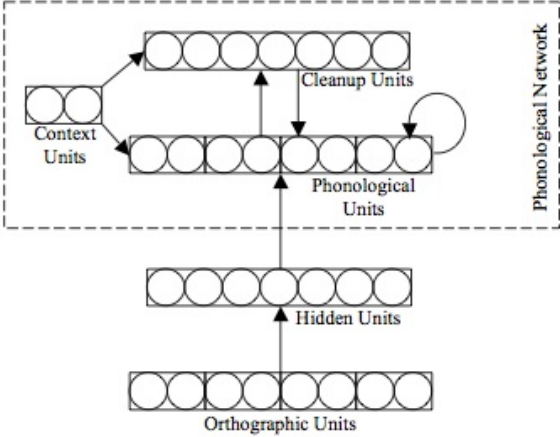


Figure 2: Performance on reading trials

